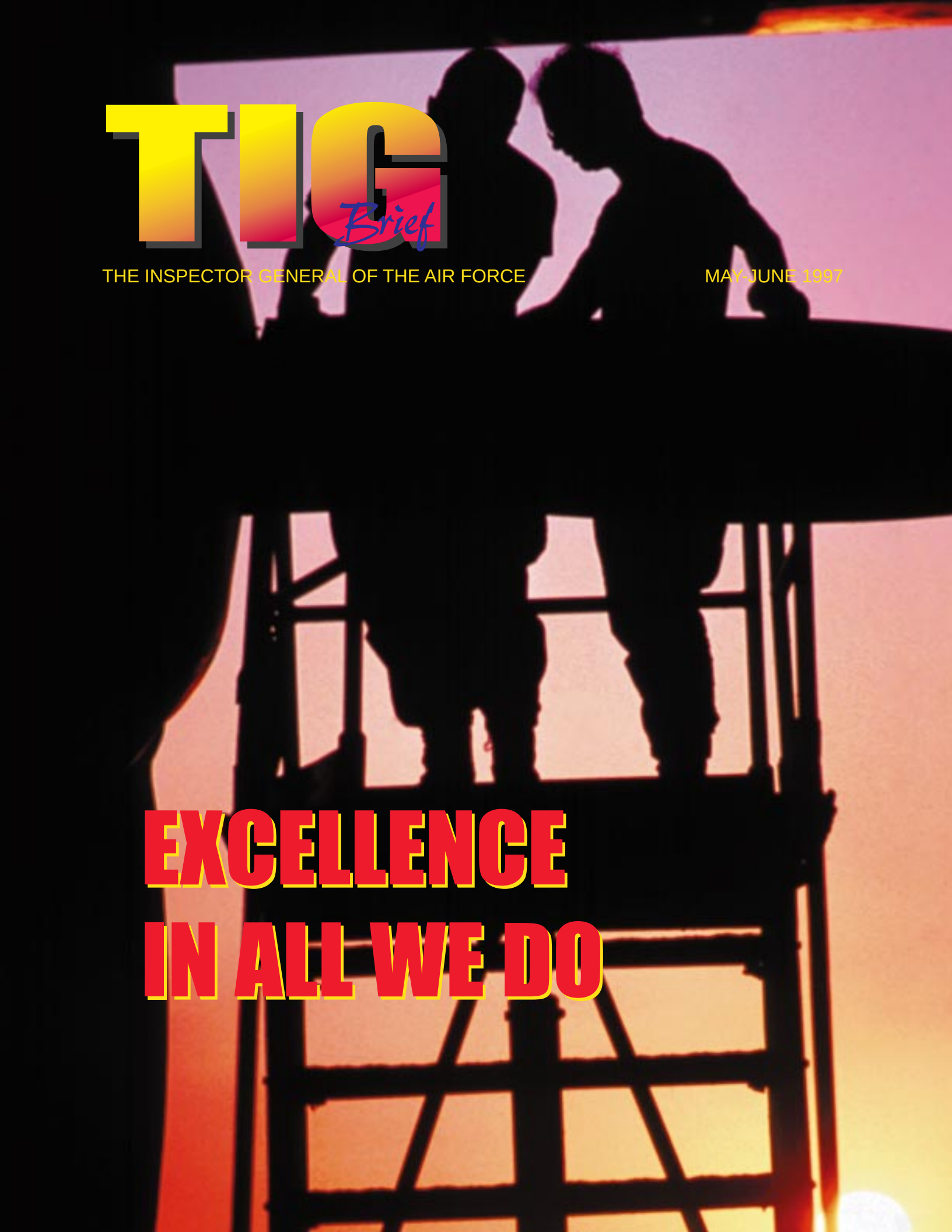


TIG Brief

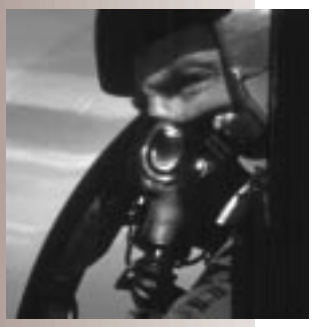
THE INSPECTOR GENERAL OF THE AIR FORCE

MAY-JUNE 1997

EXCELLENCE IN ALL WE DO

TIG Brief
Dedicated to improving the Air Force

features



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on our cover

Cover photo by
Master Sgt. Perry
Heimer

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This particular issue of *TIG Brief* is a special one because Air Force Chief of Staff Gen. Ronald R. Fogleman provides the signature article focusing on the Air Force's most vital component—its people. As a true testament to the chief's commitment to promoting continued innovation in our Air Force, we also showcase the five winners of the Chief of Staff Team Excellence Award. The ideas that won them this prestigious award are found within the pages of this issue and can be used by units throughout the Air Force to better their own programs. One theme remains the constant in all of these award-winning stories—people are the key to success.

Another important people program recently implemented by the chief of staff is operational risk management. Brig. Gen. Orin L. Godsey, Air Force Safety Center commander, provides a detailed look into the program and the three fundamentals upon which it was developed—self-discipline, responsibility, and accountability. Air Force Instruction 91-213, *Operational Risk Management Program*, outlines the program that enables commanders, functional managers, and supervisors to maximize operational capabilities while minimizing the risk to their people and material. This logic-based, common-sense approach provides the framework for decision making before, during, and after Air Force operations.

TIG Brief strives to be a value-added product of the Air Force Inspector General. One request many of our readers have made is to include more practical, "how to" articles and we are striving to include these in every issue. Our readership continues to add value by completing our biannual readership survey. The *TIG Brief* staff is collecting the data, will compile the results, and publish the outcome in an upcoming issue of *TIG Brief*.

Angela L. Hicks
Captain, USAF

Correction

In the March-April issue, page 18, Special Interest Items, the phone number for AFMC's point of contact, Maj. Rawlings, was listed incorrectly. The correct number is 787-1811.

Signature Article

People—the Key to Realizing Our Air Force Vision

by Gen. Ronald R. Fogleman

During the past several months, our Air Force has taken a number of steps to prepare for the first quarter of the 21st century. We have adopted a new strategic vision, formed a new long-range plan to help realize that vision, and are developing a new operational doctrine for the employment of air and space forces.

Thanks to the efforts of thousands of people across our service, we are well postured to take on the challenges of the future—a future that will include reduced defense spending, diverse regional threats, and continued high ops tempo for Air Force units.

> "… challenges of the 21st century lay in creating the right environment for our people… ."

In this post-Cold War era of fast rising regional crises that demand a prompt and exacting response, the unique characteristics of air and space power—speed, range, flexibility, precision, and global perspective—will make our service the force of choice for national leaders and theater commanders. As a result, we can expect to be called upon, more and more, to employ our "global engagement" capability to protect U.S.

security interests around the world.

I will tell you, though, the critical ingredient of this "global engagement" capability for the future is quality people. You are the foundation of our strength.

That fact is recognized up front in our Global Engagement vision document which states, "People are at the heart of the Air Force's military capability. It is the professionalism and dedication of our people that make our service the preeminent air and space force to meet the nation's needs."

In the end, it is our people who generate the combat capability to underwrite our core competencies of air and space superiority, global attack, precision engagement, rapid global mobility, information superiority, and agile combat support. You will be the ones who employ air and space forces across the spectrum of conflict in independent, joint, and coalition operations to achieve U.S. objectives. You will be the ones who develop innovative ways to reduce the costs of doing business, streamline operations, and determine the "best practices" to generate the most from our limited resources.

It is critical that our Air Force continues to recruit, train, and retain bright, energetic, innovative people who are intellectually agile and adaptable to a fast-changing world. Moreover, our commanders and supervisors must provide our people with a secure work environment that promotes creativity, rewards initiative, and encourages them to achieve their full potential. Combined, these conditions will help us realize our vision of the 21st century Air Force.

To afford our people the opportunity to explore new ideas, develop ingenious operational concepts, and foster promising technologies, we will establish a series of new, focused battle labs. These labs will engage the minds of our people in the pursuit of innovations in space operations, air expeditionary forces, battle management, force protection, information warfare, and unmanned aerial vehicles. Additionally, we will enable our people to help us improve how we do business by adapting our quality program to meet the needs of a 21st century Air Force. We will continue to operationalize quality and make innovative management and leadership a routine part of everyday operations—much like safety has become over the years. To this end, we have merged our quality and manpower management functions to provide a multiplier effect for innovation and process improvement across our service. Last December, we stood up the Air Force Center for Quality and Management Innovation at Randolph Air Force Base, Texas. At the major commands, we're activating quality and management innovation squadrons and flights that will directly support major command initiatives. These initiatives will provide experts to assist our leaders with the management innovation necessary to improve processes and deal with tough resource issues.

The key to our success in preparing the Air Force for the challenges of the 21st century lays in creating the right environment for our people, providing them the needed tools and assistance, and tapping their tremendous creativity and initiative. I look forward to continuing to work with all the members of our Air Force team to realize the full promise of air and space power for our nation.✦

Chief of Staff

A FIX BY EXPLOSIVE MANAGEMENT

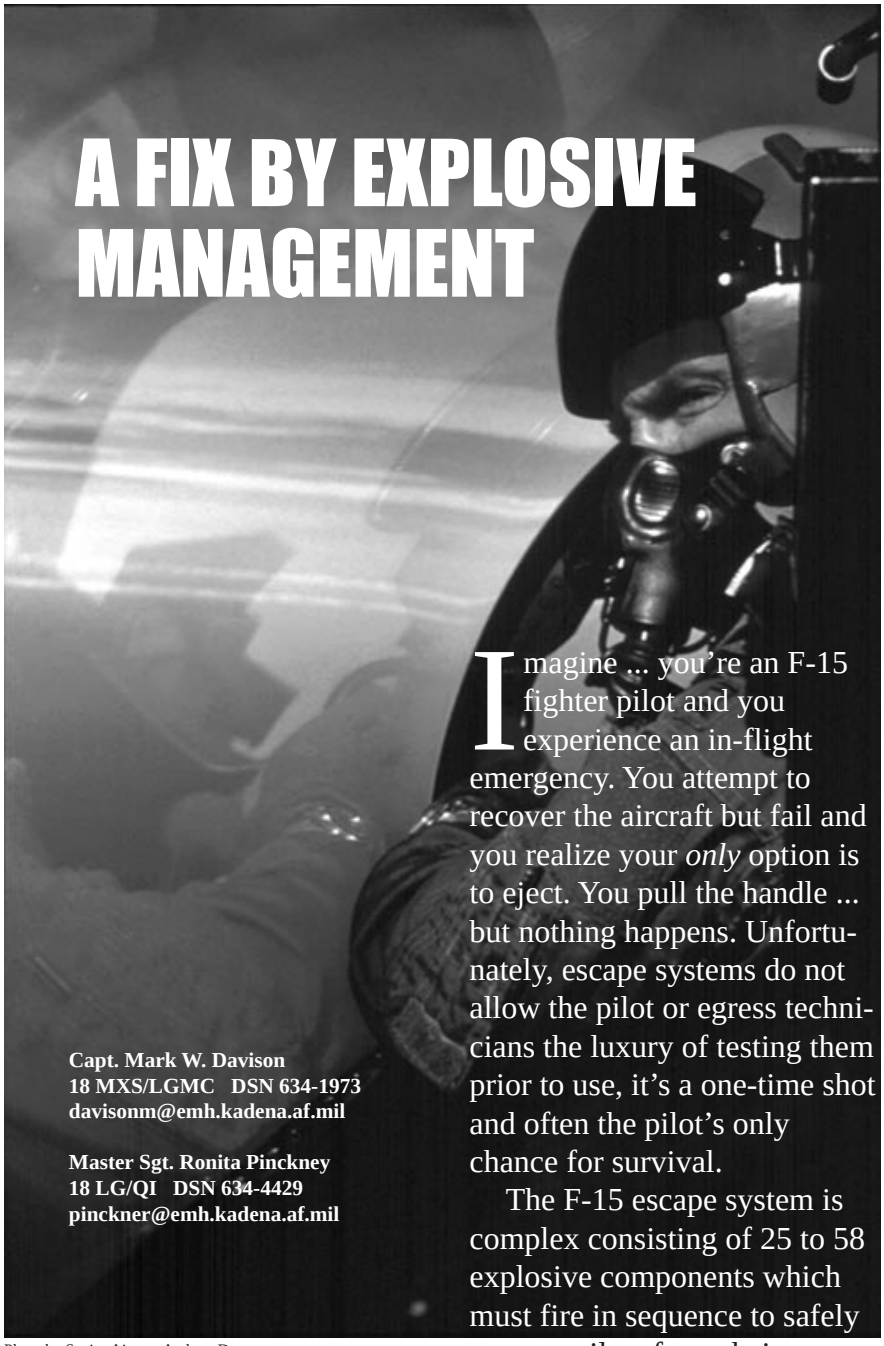

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Photo by Senior Airman Andrew Dunaway

Imagine ... you're an F-15 fighter pilot and you experience an in-flight emergency. You attempt to recover the aircraft but fail and you realize your *only* option is to eject. You pull the handle ... but nothing happens. Unfortunately, escape systems do not allow the pilot or egress technicians the luxury of testing them prior to use, it's a one-time shot and often the pilot's only chance for survival.

The F-15 escape system is complex consisting of 25 to 58 explosive components which must fire in sequence to safely remove pilots from their unrecoverable aircraft. These explosive components possess expiration dates which require them to be managed as time change items to ensure their explosive integrity. Historical data, including serial numbers and expiration dates, are maintained and updated by egress and munitions support technicians within the Air Force's core automated maintenance system data base. This data base is used by aircraft schedulers to identify aircraft with soon-to-expire parts, prompting the scheduler to remove the aircraft from the wing's active inventory and schedule that aircraft for maintenance. It is critical that these explosive components be removed and replaced before they expire: otherwise, the above scenario could occur.

The perfect sequence of events begins with the aircraft scheduler scheduling the maintenance in the core automated maintenance system. This prompts munitions support technicians to order the replacement parts and egress technicians to schedule for an upcoming maintenance action. These explosive time change items are managed using the due-in-from-maintenance system, which requires the replaced component to be returned to munitions support within 15 days after the issue of its replacement.

When the new egress superintendent, Master Sgt. Andrea Zimmerman, arrived at Kadena Air Base, Japan, in 1994 she discovered that this perfect sequence of events was far from perfect. Inaccurate component expiration dates and duplicate serial numbers, coupled with human error, resulted in faulty forecasting and caused the rest of the sequence to fall apart. The aircraft maintenance schedule became erratic and reactionary,

generating a haphazard work schedule for egress technicians who soon found themselves working extended hours. The work environment within the egress shop became oppressive, morale was low, tempers were high, errors increased, and every due-in-from-maintenance turn in was delinquent. In an attempt to ensure that components would be available when needed, munitions technicians overstocked their warehouses with new components to support the egress technicians on short-notice requests because they were unable to rely on the inaccurate data base.

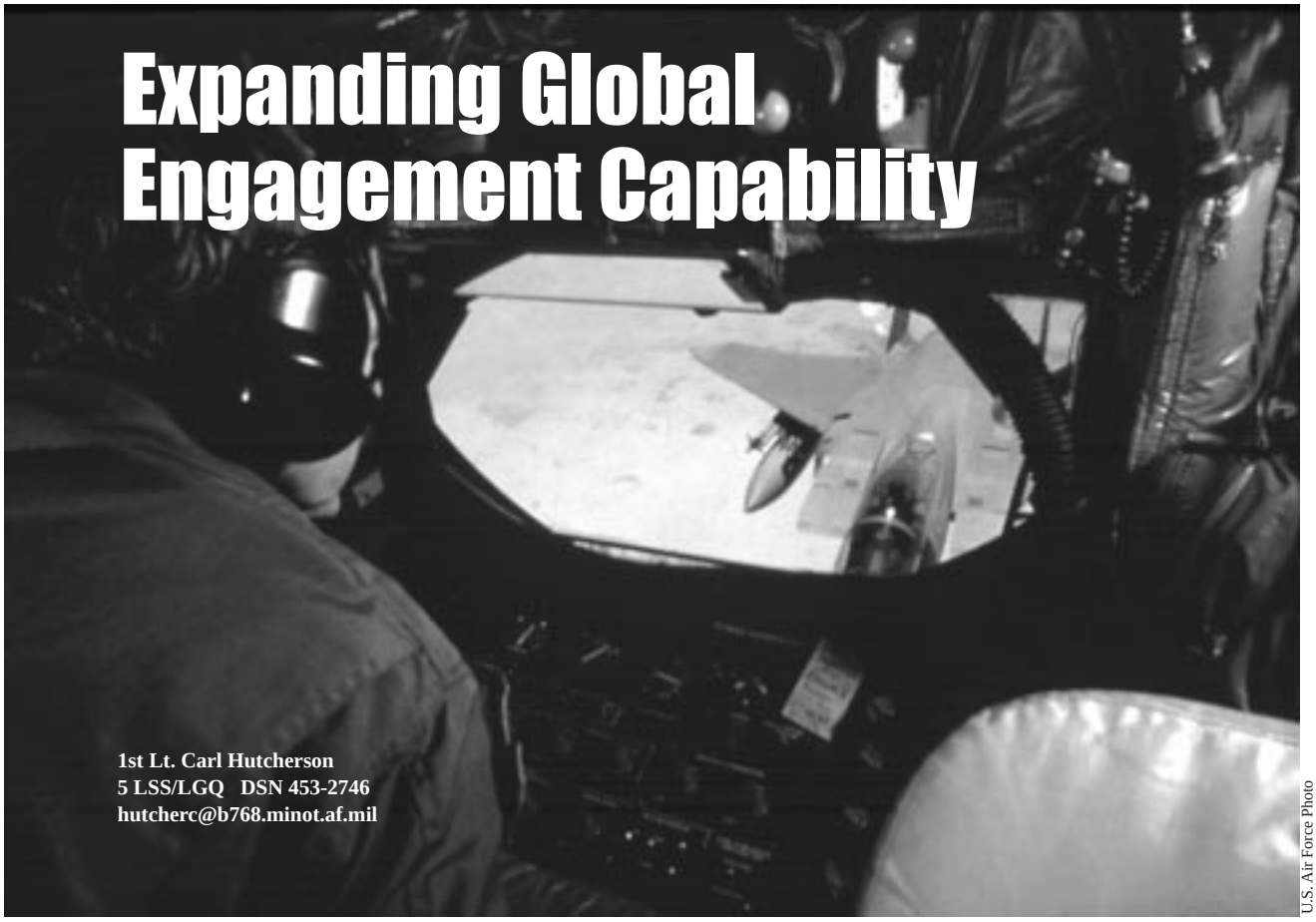
It was apparent that firm and immediate action was required to ensure the escape system's integrity remained intact. An in-depth core automated maintenance system data base review was completed, identifying 1,896 errors. Zimmerman was forced to deliver the bad news to maintenance squadron leadership. The appropriate technical orders were quoted and grounding the fleet discussed as the only option available to ensure pilot safety. But grounding the fleet was unimaginable, especially with Kadena's high ops tempo and the political conditions in North Korea. Zimmerman felt sure she could create a team, use quality principles, and develop a solid fix within a safe operating window.

The commander of the 18th Maintenance Squadron, Lt. Col. Jeffrey Roth, chartered an egress working group in early 1995 with the understanding that they identify a long-term fix and complete it within four months. The group consisted of: Master Sgt. Andrea Zimmerman, Master Sgt. David Santiago, Master Sgt. Ronita Pinckney, Staff Sgt. Myron Addison, Senior Airman Vivian Hollifield, Senior Airman Marty Bigbee, and Airman 1st Class Joseph Castillo. Applying the seven-step process improvement model as a gauge, the working group was able to identify the system time change item data base as the root cause and driver of delinquent due-in-from-maintenance items and the overstocking of explosive components. Feasibility tables and action plans helped them ensure they took the right approach and accomplished a permanent fix. Using a matrix to create a system screen, the team was able to generate a report that listed the components in a specific sequence, allowing the technician to *validate* the information entered.

The results have been astronomical and steady for more than a year. By using quality principles, the team was able to avoid grounding the entire F-15 fleet, saving more than 52,000 work hours. Developing the new system time change item data base screen which queries the user if suspect data are entered, error rates were reduced from 98 percent to less than 1 percent. The positive improvements continued to flow through the sequence, decreasing egress' 100 percent delinquent due-in-from-maintenance rate down to zero percent! As if these results weren't enough, good news came from munitions in the form of an Air Force Audit Agency report. At the working group's start, the egress munitions account was 407 percent overstocked. At the end of our process, stock levels were well within Air Force standards at only one-half percent above authorizations, which freed up more than $247,000. While each of these results is impressive within its own right, the overreaching and most important result is 100 percent reliability in our F-15's escape system. However, the impact does not stop there. The newly designed core automated maintenance system screen has been accepted Air Force-wide and is improving time change parts management on every Air Force base that maintains explosive escape systems.

The bottom line of the entire process is simple—any process that does not seem well managed or organized can and should be fixed. The Air Force is relying on every one of its members to recognize opportunities and have the integrity to come forward. Take responsibility. Recommend fixes to processes that take too much time, cost too much money, have no value, and, in this case, endanger lives. ✥

Expanding Global Engagement Capability



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U.S. Air Force Photo

In any military operation where you need long-range projection, the KC-135 Stratotanker is a vital tool for global engagement. But that's when it's flying—not when it's sitting idle on the ramp awaiting servicing by maintenance. In November 1995, the 22nd Air Refueling Wing at McConnell Air Force Base, Kan., experienced high nonmission capable-for-maintenance times—the time an aircraft sits idle awaiting maintenance. Their mission capability rate—the percentage of aircraft that is capable of completing missions assigned to the wing—was almost 8 percent below the command's standard. The wing searched for an answer. The major contributor to nonmission capable-for-maintenance time was the fuel system repair section. Sixty-three percent of the wing's November total nonmission capable-for-maintenance time was due to fuel system discrepancies. At one point, there were six aircraft waiting to enter the fuel systems repair section. This was totally unacceptable and quick action was necessary to improve their customer's satisfaction and confidence level in their product.

The wing commissioned a cross-functional team to reduce the releak and repeats in the fuel systems repair section by 50 percent. The team constructed a pareto chart of all KC-135 releaks or repeat repair components in the past 12 months. This pareto chart showed us vividly that our greatest opportunity is in reducing fuel bladder cell releaks, those that occur in a previously repaired area. Releaks were by far the most time consuming and costly maintenance repair item on the chart. We used a technique called "nested paretos" to narrow a broad subject, such as all the releak or repeat repair components in the wing, into a smaller, more focused area, such as fuel bladder cell releaks in the wing. The process of taking a large problem and reducing it into manageable groups is the key to process improvement for large problems which would otherwise overwhelm a team and make a clear path to the solution hard to ascertain.

All log book entries for the 20 fuel bladder cell releaks were listed for review by the team and categorized according to the leak origination area. This information showed the forward body "O" cell releaked more than any other cell—a total of five releaks during the year.

After close examination of these individual releaks, we discovered something totally unexpected. Each of the five releaking forward body "O" cells was repaired by replacing it with another cell. In other words, each of the five forward body "O" cells was not the actual leaking cell. We realized we needed to look at our trouble-shooting policies and procedures. When we reviewed our data and examined every fuel bladder cell releak closely, we found an even greater disparity. Sixteen out of the 20 total fuel bladder cell releaks were incorrectly diagnosed. The wrong cell was replaced and after a leak check failure, the actual

leaking cell was found. The remaining four fuel bladder cell releaks came from cells that had been cut during installation. These cells had all been cut in the same month and we discovered that this was the same month our local supply began issuing fuel bladder cells from a new manufacturer. These new cells were much thinner and easier to handle but much easier to damage or cut.

With these new findings, we worked our way through a cause-and-effect diagram. There were three root causes to our fuel bladder cell releak problem. First, our cells were now thinner and required more caution and care during installation to avoid damage. Second, leaking fuel from a cut or damaged bladder cell travels along the ribs of the aircraft into nonleaking fuel cell cavities and out of the nonleaking fuel cell drain. Third, 67 percent of the fuel systems repair section staff held only a three-skill level in their Air Force specialty code. Some mistakes were made in "O" ring removal and installation and fuel bladder cell handling due to the following factors: low experience level, excessive deployments of skilled technicians, and skilled technicians who did not deploy were being spread thin due to a three-shift operation. Many three-skill level technicians were left with the responsibility to complete the fuel systems maintenance at home station.

After evaluating the root causes, we developed actions and methods for achieving the plans. We moved swiftly and implemented these policy and procedural changes in early December 1995. The results of the team's implementation of its improvements has been outstanding. The fuel systems repair section incurred only one fuel bladder cell releak in six months. At the time of the implementation, the section averaged 1.25 cell releaks per month. Each cell releak that occurred costs the Air Force an average of $2,500 in work-hours alone to repair. It also reduced the 22nd Air Refueling Wing's mission capability. Since December 1995, cell releaks have dropped from an average of 1.25 per month to 0.2 culminating in a savings of $2,500 per month.

These were outstanding savings but the team's job was not over—there was still the problem of fuel valve repeats to solve. A repeat occurs when maintenance is performed on a component, such as a fuel valve, and when it is checked, the repaired or replaced component does not function properly. There were ten valve repeats within the 12-month time frame. Analysis revealed that six of the valve repeats were attributed to circuit breakers popping after a new valve was installed and four were due to valves leaking after installation. The team then constructed a cause-and-effect diagram and found three potential root causes from this diagram. First, some valves may have been issued unserviceable. Second, when trouble shooting a valve problem, most electricians only check for voltage. Valves also have amps and ohms to operate. The current technical order trouble-shooting procedures did not require an electrician to check for amps and ohms, only voltage. These checks should be accomplished each time to isolate a bad valve. Electricians are not trained to check for amps and ohms and the technical order does not require these checks. Third, electrical checks are limited to valves that are mounted externally to the tank. Internal tank valves must be checked at a splice point, leaving the area between the splice point and the valve unchecked. This unchecked area is where the actual problem exists—a potential wiring short.

The team implemented an action plan to reduce valve repeats by providing a list of frequently used fuel valves to supply. Supply added these valves to a functional checklist that ensures that when a new valve is received on base from depot, the valve is sent to the electrical shop for an operational check. If the valve is found to be serviceable, it is tagged and ready for issue to the fuel systems repair section. This isolates any unserviceable valves that are received from our supplier. The team implemented procedures to isolate any valves which were removed from the KC-135 aircraft. An operational check was accomplished on the suspected bad valves and a determination of the valves' serviceability was made.

The goal of the fuel systems repair section process action team was to reduce the releak and repeats in the section by 50 percent. This goal was exceeded and an 84 percent reduction was realized. The present rate of 0.2 releaks per month results in savings of $2,503 per month in work-hour costs—$30,036 the first year. It also reduces nonmission capable-for-maintenance time at McConnell Air Force Base by 41 hours per month. This frees 130 work-hours that can be used for other maintenance actions. It increases aircraft availability by 492 hours per year—allowing an airframe to fly for an extra three weeks per year. The mission capability of the wing also increased by 0.4 percent per month.

Additional savings were achieved by the process action team repairing fuel bladder cells on base. The potential savings from patching cells on base and turning them in serviceable was $147,000 in the first year. It will also potentially save 413 hours of nonmission capable-for-supply time, which equates to one extra airframe to fly for 17 days and an increased mission capability of 0.3 percent per month. The total first year savings for the fuel systems repair section process action team's improvements was more than $210,000.✥

Readiness Through Aircraft Availability

Photo by Senior Airman Andrew Dunaway

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Aircraft maintenance inspections are a time-consuming process and nowhere is that more evident than in an Air Force Reserve Command unit. The average age of the Reserve's fleet of C-5As, C-141Bs, KC-135Es, and KC-135Rs is more than 32 years. Isochronal—regularly scheduled maintenance overhauls performed annually—and refurbishment inspections are critical to keep the aircraft in top flying condition. During the refurbishment process, the aircraft is checked for corrosion and cosmetically upgraded. To decrease the amount of time aircraft spend in the inspection process, the Headquarters 4th Air Force logistics leadership at McClellan Air Force Base, Calif., led and facilitated a working group consisting of 25 maintenance personnel from four different bases representing the three aircraft types. This resulted in an unprecedented opportunity for improvement. What they came up with is a better way of performing the inspections that greatly increases aircraft availability and mission readiness.

This quality improvement team was a little different than most because it was comprised of three teams in one—a C-5 team of maintenance workers from the 433rd Airlift Wing, Kelly Air Force Base, Texas; a KC-135 team that included specialists from the 940th Air Refueling Wing, McClellan Air Force Base, Calif., the 507th Air Wing, Tinker Air Force Base, Okla., and the 452nd Air Mobility Wing, March Air Reserve Base, Calif.; and a C-141 team of workers from the 452nd Air Mobility Wing. Each team

Average Age of Air Force Reserve Command's Fleet

Aircraft	Age in years
C-5A	27
C-141B	30
KC-135E	37
KC-135R	35

worked on improving the isochronal and refurbishment inspection process for its particular aircraft type and then shared ideas within the work group.

The teams used the Air Force Reserve Command Nine-Step Quality Improvement Process. The teams developed approaches that assisted in collection, distribution, and maintenance of pertinent information so that fact-based decisions could be made consistently. Through pareto analysis, factors affecting aircraft availability were determined. Programmed depot maintenance was the largest, followed by isochronal inspections and refurbishments. We did not control the process, so we began to look at the isoschronal and refurbishment inspections for improvements. Customers and suppliers were identified and their requirements were determined through surveys and interviews. The team developed a process map for the current "as is" inspection process using factors of time, people, money, and percentage of process.

The teams reduced and standardized the time required to accomplish an isochronal and refurbishment for each type of aircraft. Taking control of the process has now allowed for scheduling as far as one year in advance. This forecasting allows scheduled maintenance and training to be maximized. Many of the improvements came from workers who were more in touch with the inner workings of the process. Storyboards provided a daily place for people to share these ideas. These ideas are now part of the new process and workers see firsthand that their voice counts and quality works. The team identified tasks that consumed the most time and, in many instances, with limited impact on the process. For example, the hangar tow in, maintenance stand positioning, and depaneling on a C-141 took six days, or 144 clock hours, with five individuals working on the process and yet consumed only 11 percent of the overall process.

Eventually, the team was able to reduce overall inspection time by standardizing the fuel cell repair for all aircraft, adding workers at key times to reduce clock hours, streamlining the inspection "look" and "fix" phases, and eliminating preinspection engine runs. Benchmarking with civilian aircraft companies, active duty wings, and other Guard and Reserve units revealed further process improvements. "The results are even better than we had hoped for," said Col. George Leonard, the work group leader. "In January 1996, we were predicting $900,000 in workforce dollars saved for the year. Now it's approaching four times that much."

Improvements resulted in an overall decrease in aircraft flow days through the inspection process of 292 days for the first 24 aircraft, reducing the process by 33 percent. Aircraft flow was reduced from an average of 45.5 days to 22.7 for the C-141B and from 33.6 days to 19.5 for the C-5A. The KC135E and R isochronal and refurbishment inspections formerly took an average of 23.9 days and 15 days, respectively. Now, the Stratotankers are going through a combined isochronal and refurbishment inspection in about the same time formerly required for the isochronal alone—25.7 days. The long-term goal is to achieve a 50 percent reduction in cycle time by the year 2000. The bottom line is by having "more iron on the ramp," 4th Air Force aircraft capabilities increased or exceeded customer requirements to meet the needs of worldwide global airlift.

The team's improvements can be used throughout the Department of Defense for all military services with aircraft and heavy equipment overhaul and repair activities. Department of Defense wide, the potential savings is millions of dollars.✥

Critical Life Support Facility Gets Overhaul

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To better support the war fighters, Air Force Materiel Command and its air logistics centers began the change to lean logistics in 1994. The vision that shaped and defined the parameters of that change has been to give the war fighters what they need, when they need it, at the least possible cost to the American taxpayer.

The new, lean logistics system must first meet every mission requirement of the various commands during peace and war. There must be a way to identify the processes that add the most in inventory cost and operating expense, so they can be improved.

Photo by Senior Airman Andrew Dunaway

Each air logistics center chose one shop to implement the vision. In October 1994, the Oklahoma City Air Logistics Center's lean logistics process action team chose the oxygen shop.

The oxygen shop is the only oxygen overhaul facility in the Department of Defense. Each year, the shop overhauls, tests, and calibrates 8,000 critical life support items including oxygen breathing systems for aircrews and passengers, oxygen converters, survival kits, and anti-gravity valves. The shop supports every Air Force major command, all sister services, NATO, NASA, the Federal Aviation Administration, and many foreign nations.

The team addressed three processes in the depot segment of the pipeline: requirements determination, repair, and base movement. The requirements determination process is needed so the shop mechanics know what to fix. The repair process takes place in the shop and includes all the steps required to turn a repairable asset into a serviceable asset. Repairable and serviceable assets move between the storage facilities and the shop during the base movement process.

In the old process, it took 183 days on average to determine requirements and start to repair parts. The 183 days were spent verifying data that would be used to compute a forecast: calculating the forecast requirement, checking the funding position, and negotiating with the shop's management as they sought to allocate the resource capacity available in the shop. On the average, it took six months to go from the data cut-off date to the day the first item went to the shop to be repaired. As a result, under the old process, the shop fixed parts based on demand patterns at least six months old. Under lean logistics, the shop needed to know in near-real time what was failing in the field so current demands for parts could

drive daily work.

Monitoring wing demands to determine the daily repair requirement was difficult and had to be done at first by hand. That meant requirements were determined on a weekly not daily basis for the first three months of the test. To solve this problem, the team developed software to calculate the need, check for assets, and identify needed repairs. With this automated induction system working, the shop knew in near-real time what the requirement was and the shop mechanics could work the items that had failed in the field the day before.

Within the shop, the team used a simulation model to map the processes. The team was looking for improvement targets. The model told them that most of the total shop flow time accumulated because parts were waiting to enter a process, not because of actual hands-on process time. This information drove the team to stop batching items wherever possible. The model also identified some unnecessary steps. Average time in the shop fell from 56 to 10 days.

The team also found that asset movement on base did not follow the lean logistics tenet of using fast transportation to shorten the pipeline. But as the shop eliminated batch processing, the local Defense Logistics Agency storage and distribution operation was able to improve their flow days substantially. The Defense Logistics Agency also set up a special processing line in their receiving area to ensure expedited movement for lean logistics items and also used express commercial carriers for off-base shipments. With the cooperation of the Defense Logistics Agency oxygen shop staff, assets were handled in a "move it now and move it fast" mode. This cut base movement time tenfold.

The reduction in pipeline time accomplished by customer-demand-driven repair, streamlined shop flow and rapid base movement cut the total requirement for oxygen shop items. The value of assets no longer needed in the shorter pipeline was calculated at $24 million.

The shorter pipeline has also improved support to the war fighters. Not-mission-capable hours fell rapidly to less than half their former number. Ten oxygen shop items were in the Air Force's critical item program before—now there are two.

Using the lessons learned in the early implementation of lean logistics tenets, the Air Staff trimmed the budget by nearly $800 million, confident that shorter pipelines will allow fewer assets to provide better support. Like industry, the Air Force has learned that consolidated inventory and capacity combined with responsive, focused distribution provide support that is better, faster, and cheaper.✥

Lean Logistics Tenets

1. *Customer-Demand-Driven Repair.* The introduction of workload into depot shops is caused by a customer demand. The customer is in charge.

2. *Fast Transportation.* One simple system—move everything fast everywhere. "FedEx taken to the extreme." Transportation costs are more than offset by shorter inventory pipelines, as we shift from an inventory and supply-based logistics system to a transportation-based system.

3. *Demand Driven Supply.* The requisitioning of raw materials, components, or bits and pieces by the depot supply account is caused by a production demand. This is also known as "one-for-one replenishment."

4. *Continuous Improvement.* Develop the mechanism that continuously identifies those processes that cost the most in terms of protective capacity and/or inventory because of their measured variability. With these most expensive processes identified, variability reduction and cost reduction can take place in a businesslike fashion.

Enhancing Weapons Storage Area Security

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U.S. Air Force Photo

In May 1994, the Defense Special Weapons Agency and Air Combat Command conducted a joint exercise at Ellsworth Air Force Base, S.D. This tri-service force-on-force exercise called Mighty Guardian evaluated weapons storage area security effectiveness. It turned out to be an eye-opener for all associated with weapons security. The exercise after-action report specifically cited backup force response and adversary delay and denial as critical improvement areas to prevent loss, theft, or seizure of priority resources.

As a result of this exercise, Gen. Ronald R. Fogleman, Air Force chief of staff, empowered all units with weapons storage areas to address the weak areas identified in the report. The 321st Missile Group at Grand Forks Air Force Base, N.D., assembled a process action team to handle the task.

The team recruited security, maintenance, and civil engineering specialists to involve all affected organizations in the solution. The team then applied the Quality Air Force Seven-Step Continuous Improvement Model to determine the best solutions.

After thorough analysis, solutions to near-term improvement opportunities such as equipment purchases, procedural changes, and administrative tasks were quickly implemented. Backup force response time and delay and denial barrier problems were identified as mid- and long-term issues, respectively.

In addressing the backup force issue, the team found that individual response, congested response location, weapons issue, and vehicle readiness were the main contributors to lagging response times. The team studied the possibilities and developed an action plan. Some key aspects of that plan include the following:

- Squadron members were trained on recall response. The backup force is now pre-identified on the recall roster.
- To alleviate congestion at the armory, only the backup force responds there—all other members respond to a secondary location. When the team arrives at the armory, they now sign for a preidentified weapon.
- To ensure response vehicle availability, prioritized vehicles are held ready where selected drivers pick them up en route to the armory.

The long-term solutions involved delay and denial equipment procurement and deployment. To improve delay and denial capability at the storage area, the team brainstormed various equipment options considering their effectiveness given the local environment, weapon storage area layout, and available funds. The team then took into account the capabilities of their expected enemy and how best to neutralize any advantage they possessed.

Based upon their analysis, the team selected three barrier types: large concrete "King Tut" blocks, vehicle anti-ramming cables, and helicopter denial poles. "King Tut" blocks are reinforced concrete blocks anchored in front of storage structures designed to delay or deny hostile force access to priority resources. Helicopter denial poles are strategically spaced telephone poles connected by "mule tape." These poles are designed to prevent unauthorized helicopter landings and aerial insertion or egress of hostile forces. Vehicle anti-ramming cables are constructed of steel and suspended inside and outside the perimeter fence. These cables are designed to prevent fast moving vehicles from physically penetrating the perimeter.

The team examined the new response processes during three exercises and found response time improved by 52 percent. While the "King Tut" blocks haven't been operationally tested, computer simulation has verified the team met their target by increasing overall delay and denial time by 117 percent under ideal conditions—conditions a hostile force would be unable to duplicate.

New standardized procedures for the backup force include:

- Upon recall notification, the backup force is notified first. Members don uniforms and respond directly to the armory. On-scene supervisors ensure responding personnel are quickly armed and briefed on the situation before dispatching to the weapons storage area as a team.
- The old 19-step recall process was streamlined to 14 steps.
- The team's suggested procedures have been integrated into base, group, and squadron operational plans, instructions, recall procedures and training scenarios.
- Procedures for using "King Tut" blocks in the weapons storage area have been integrated into maintenance operating instructions.

"We've taken a quality approach to enhance weapons storage area security," said Lt. Col. David Martin, commander of the 321st Security Police Squadron. Martin believes their new probability of success is now 99 percent, a substantial increase in their "win factor" against a hostile force from their previous state of readiness.✥

Photo by Master Sgt. Perry Heimer

Operational Risk Management

A Challenge for Senior Leadership and Supervision

by Brig. Gen. Orin L. Godsey

As we begin the task of implementing operational risk management within the Air Force, we must also strive to keep our focus. It would be a huge mistake to allow this innovative process to be perceived as another elaborate safety tool devised by an Air Force hierarchy that's out of touch with the realities of risk-benefit tradeoffs.

Quite frankly, there is a healthy skepticism—if not outright cynicism—on the part of many Air Force members regarding any new management or decision-making theory or practice. It seems we no sooner learn the jargon of the latest management vogue then it is superseded by a newer, ultra-hyped "super system." Small wonder that many of us became jaded years ago.

I find it troubling, however, to hear debate on the prejudged complexities of operational risk management and speculation on the difficulties of training people. There are, of course, some rather complex risk assessment methodologies used in highly specialized settings and applications. On the whole, though, risk assessment and management of risk are straightforward, uncomplicated processes that anyone can apply. We need to view them and publicize them as practical, common-sense tools for everyone to use.

The operational risk management process is ingenious in the way it dovetails with the conventional wisdom we have learned from every major authority figure in our lives. It requires us to recognize risk as implicit in virtually everything we do and then take steps to eliminate, or greatly mitigate, its adverse effects.

Operational risk management demands self-discipline, responsibility, and accountability—the same core precepts the Air Force Chief of Staff Gen. Ronald R. Fogleman has charged us to place at the center of our personal and professional conduct. Self-discipline is needed to continuously make fundamental risk assessments, ranging from intuitive and experience-based appraisals in familiar situations to deliberate and systematic approaches in unfamiliar circumstances. Based on our assessments, we must exercise responsibility and, ultimately, accountability in heeding all lessons and limitations and in accepting only those calculated risks where the benefits clearly outweigh the uncertainty.

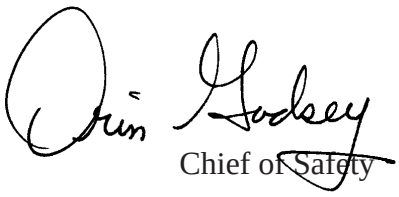
Almost half of all Air Force mishaps are caused by individuals who are trained in proper procedures but intentionally choose to ignore them. What does this say about self-discipline? A breakdown, in approximate percentages, of the other half of our mishap causes is supervisory failure - 16 percent, inadequate or incorrect training - 15 percent, natural phenomena or environmental factors - 6 percent, faulty standards or procedures - 5 percent, design deficiencies - 5 percent, and inadequate resources - 3 percent. Of these seven categories, the individual represents the single greatest target for improvement and thus a candidate for operational risk management instruction. The problem here is that a person who ignores proper procedures has, in effect, already violated the principles of operational risk management.

It becomes apparent that more than just training of techniques and principles is needed if operational risk management is to have an impact on the 50 percent of mishaps caused by individuals. A cultural change—on the order of the movements that altered our attitudes toward smoking or brought about widespread use of seatbelts—will be needed to produce the desired results. Leadership and supervision will have to modify attitudes and raise expectations by demanding that Air Force people exercise self-discipline, responsibility, and accountability as a condition of service. Only in that climate can operational risk management, or any other management tool, function successfully.

As senior Air Force professionals, we have an obligation to deliver a system that is simple, direct, reasonable, and effective. The six-step operational risk management process outlined in Air Force Instruction 91-213, *Operational Risk Management Program*, best represents that practical yet powerful tool we must provide to every individual. Our people must be able to identify hazards, assess risks, recognize control measures, make and implement control decisions, and follow up on the results and effects of their choices.

I emphasize again that it's a matter of focus. We must not allow our proximity to the minutiae of operational risk management to obscure the principal goal of placing an uncomplicated, workable risk assessment tool in the hands of Air Force people. It should be a tool they can willingly accept and readily apply in every aspect of their personal and professional lives—one that will yield substantial benefits in enhancing mission effectiveness while eliminating costly mishaps both on and off the job.

Sir Winston Churchill once said, "You can always count on Americans to do the right thing, after they've tried everything else!" We need to prove the esteemed Englishman wrong in this instance. We have to get it right the first time!✥



Chief of Safety

Summary of Recent Audits

Ms. Terri Buckholtz
AFAA/DOO DSN 426-8012

The Air Force Audit Agency provides professional and independent internal audit service to all levels of Air Force management. The reports summarized here discuss ways to improve the economy, effectiveness, and efficiency of installation-level operations and, therefore, may be useful to you. Air Force officials may request copies of these reports or a listing of recently published reports by contacting Ms. Terri Buckholtz at the number above, E-mailing to reports@af.pentagon.mil, or writing to HQ AFAA/DOO, 1125 Air Force Pentagon, Washington DC 20330-1125.

Management of Aerospace Ground Equipment at an Air Education and Training Command installation required improvement. Maintenance personnel effectively controlled equipment maintenance and schedules, and equipment accountability was proper. However, equipment management personnel did not maintain all equipment within current allowance standards. Specifically, equipment management personnel did not review allowance change notices received from the Air Force Equipment Management System and did not reduce applicable authorizations, request turn-in of 47 excess items, or cancel eight unjustified due outs. Subsequent reductions of authorizations, redistribution of excess items, and cancellation of due outs would result in funds put to better use totaling $1.3 million. *(Report of Audit 27097007)*

Management of Billeting Operations at a Pacific Air Forces installation was not effective. Specifically, billeting personnel did not accurately maintain occupancy data, and reported room revenues did not agree with financial statements. In addition, billeting personnel did not accomplish required annual contract quarters inspections and did not properly control or issue certificates of nonavailability. Further, contract quarters were used when on base quarters were available costing the Air Force an estimated $196,000 annually. Transient billeting quarters are operated to provide adequate rooms for official travelers and conserve funds through reduced travel expenses. *(Report of Audit 25597013)*

Air Force Software License Management at an Air Force Space Command installation needed improvement. Specifically, local area network managers and base personnel used software without licenses and network and organizational computer managers did not always properly accomplish software inventories. In addition, base personnel used software loaded on computers that duplicated network software and organizational computer managers could not trace all software licenses to software programs. Base personnel must conduct periodic inventories to detect unlicensed software and prevent duplicate software purchases. Furthermore, management must ensure that all computer software licenses are properly acquired and distributed, copyright laws are complied with, and base software license users are properly educated on the laws governing software. *(Report of Audit 52197015)*

Review of the Fund Control Process, Fiscal Year 1996 Air Force Consolidated Financial Statements at an Air Force Materiel Command installation revealed needed improvement over fund control data internal controls. This review, related to requirements of the Chief Financial Officers Act, disclosed that resource advisors did not always ensure excess undelivered orders and outstanding obligation balances were deobligated. Management agreed to deobligate the excess balances, resulting in a potential monetary benefit of $7.8 million. *(Report of Audit 40297008)*❖

An Odyssey in Healthcare

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The Air Force took the initial step in redefining healthcare oversight during January 1997 with the signing of a memorandum of understanding leading the way to out sourcing and improving oversight activities. The memorandum, a result of a cumulative effort by the Air Force Inspector General, the Air Force Surgeon General, and the president of the Joint Commission on Accreditation of Healthcare Organizations, substantially decreases the amount of oversight to which our Air Force medical treatment facilities are subject.

In January 1996, the Air Force Inspector General and the Air Force Surgeon General established the Medical Oversight Board as a clearinghouse and coordinating body for medical oversight issues. At the initial meeting, the Medical Oversight Board chartered a working group to review the current medical oversight process and make recommendations for improvements. The working group was led by the Air Force Inspection Agency Medical Inspection Directorate and included representatives from medical and inspector general active duty, Reserve, and Air Guard personnel. The working group's charter was to:

- Identify and recommend mechanisms to deconflict; oversight activities to which Air Force medical organizations are subject;
- Identify and recommend mechanisms to reduce unnecessary duplication of oversight activities by various agencies;
- Identify and recommend mechanisms to resolve inconsistencies among and within oversight activities;
- Identify gaps in the oversight process;
- Identify oversight activities in which all medical organizations must participate;
- Develop recommendations for collecting and sharing information relevant to oversight activities; and
- Identify other opportunities for improvement.

The working group identified significant redundancy between the Air Force health services inspection and the JCAHO accreditation surveys in active duty units. They developed four options to address the Air Force medical oversight process for active duty units. They were:

Continue current oversight process. The working group unanimously agreed this was not

the best option considering the amount of redundancy and preparation time required for each oversight activity.

Eliminate the Air Force health services inspection process, resulting in the termination of Air Force-level oversight of active duty medical organizations. This option would result in reduced work-hours, dollars, and duplication of effort. However, there are numerous Air Force-specific areas, which would be gaps because the JCAHO does not inspect these areas. In addition, it was not consistent with Air Force Instruction 90-201, *Inspector General Activities*, mandating independent oversight.

Eliminate the requirement for JCAHO accreditation, also resulting in significant savings in dollars and work-hours, and reduced duplication of effort. However, this accreditation is required by Department of Defense and Air Force policy for active duty medical organizations and is the accepted standard for civilian medical care. In addition, this accreditation is required for post-graduate residency training programs and if implemented, Medicare subvention.

Develop an Air Force and civilian combined oversight process, eliminating needless redundancy and allowing oversight to be outsourced to appropriate civilian authorities where feasible, while ensuring Air Force standards are met. This proposal results in significant cost savings to the Air Force, elimination of redundancy, and reduction of inspection frequency.

The working group concluded that the combined Air Force and civilian approach was by far the best alternative. Initially, out sourcing would be with the JCAHO as the current civilian standard. The recommended options and alternatives were briefed to the Air Force Surgeon General, Air Force Inspector General and each of the major command surgeons. The adopted proposal, designated Project Odyssey, has the primary objective of streamlining, reducing, or eliminating unnecessary inspections of active duty medical units. Several other benefits include those annotated in the box below.

With the support of the major command surgeon generals, alpha tests were planned for December 1996 at the Kelly Air Force Base clinic and Eglin Air Force Base hospital in conjunction with their scheduled JCAHO surveys.

To prepare the test sites for the new inspection process, the inspection agency's medical inspection directorate created a new draft inspection guide which eliminated redundant activities. This was distributed to the alpha test site organizations and site briefings were presented to the senior staff to gain their "buy in." The alpha tests were very successful with medical unit personnel praising the combined effort. Lessons learned from the alpha tests were incorporated into the guide for the beta tests at the U.S. Air Force Academy and

BENEFITS

Appointment cost recaptured at each medical unit	From 75-1,600 outpatient appointments per facility/health services inspection* Estimated cost savings $8,650-$184,500/medical unit/health services inspection*
Inspected medical unit preparation work-hours saved	250-70,000 hours per facility/health services inspection* Inspected medical unit work-hours saved 40-10,000 hours per facility/health services inspection*
Reduced number of inspections	Simultaneous Air Force and civilian inspection eliminates one large scale inspection per year
Air Force Inspection Agency Surgeon General inspector days saved per inspection	40 inspector days/health services inspection

*** Major command surgeon estimates**

Kirtland Air Force Base. At these beta sites, the JCAHO surveyors and Air Force inspectors worked well as a team. Medical unit personnel again praised the joint inspection process and the elimination of duplication. A final beta test is planned at Keesler Air Force Base medical center. The guide will be furthered modified as a result of the beta tests and distributed to all active duty medical units with full implementation of Project Odyssey in August 1997.

While the number of inspectors on the health services inspection team will be reduced, there will still be approximately five to six inspectors participating in the joint inspections of Project Odyssey. This tailored Air Force inspection team will inspect areas not surveyed by the JCAHO or areas where Air Force guidance is more stringent than JCAHO standards. In the future, the Project Odyssey concept is also being expanded to include use of relational data bases and the development of a continuous oversight process in lieu of most oversight inspection activities.

Implementation of Project Odyssey will also allow for realignment of medical inspectors to support current and new agency and medical inspection directorate missions and roles. Inspectors assigned to the active duty medical inspection process will be available to inspect the Reserve and Guard units, which require additional effort to maintain an acceptable inspection schedule. Inspectors will also be available to inspect aeromedical evacuation and geographically separated units—areas recommended by the Medical Oversight Board working group as requiring oversight. The result will be a merging of active duty and Reserve and Guard inspection divisions into a single process allowing more standardization among them and promoting the mirror-force concept. Moreover, Project Odyssey will allow Air Force Inspection Agency Medical Inspection Directorate personnel to more actively participate in the increased inspector general operations requirements, multidisciplinary management reviews, and theater operations assessments.

In addition to Project Odyssey, Air Force Inspection Agency Medical Inspection Directorate inspectors chaired the Aeromedical Evacuation Working Group and the Prevention and Environment Working Group. The Medical Oversight Board chartered these working groups to identify and deconflict oversight processes in their specific areas of interest and identify other opportunities for improvement. The aeromedical evacuation working group was also to develop an inspection guide and make recommendations to close gaps in aeromedical evacuation oversight. Both working groups presented recommendations to the Medical Oversight Board which were approved. As a result, areas which have satisfactorily passed an inspection by another oversight activity; such as the Environmental Compliance, Assessment, and Management Program; will not be reinspected during the health services inspection.

In addition to these two working groups and Project Odyssey, Air Force Inspection Agency Medical Inspection Directorate personnel were actively involved with the Air Force Medical Readiness Working Group. The mission of this working group was to develop standard readiness performance criteria for major command inspections of their medical units.

These independent projects undertaken by Air Force Inspection Agency Medical Inspection Directorate personnel demonstrate support for the Air Force Medical Service and the Air Force Inspection Agency missions. The ultimate benefit of these projects is a significantly improved approach to medical oversight of all Air Force medical units.✥

Editor's note: If you have questions concerning Project Odyssey, please call Col. Dave Camacho, DSN 246-2444.

Environmental Laws Have Changed the Way We Do Business

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Since Earth Day, 1969, the environmental laws in the United States have changed dramatically. The laws have changed the way we manufacture our products, produce electricity, and consume energy in our automobiles. These changes have extended to the way military facilities operate. Military facilities must comply with all the laws that have been passed by Congress and implemented by the states in conjunction with the Federal Environmental Protection Agency.

Many Air Force members are familiar with the effort to recycle aluminum soda cans and paper, efforts which conserve precious landfill space and reduce the amount of resources needed to produce more products. Of more immediate importance to the Air Force are the numerous regulations dealing with solvents and hazardous materials use. The laws control the purchase, use, and disposal of materials used everyday in the maintenance of our aircraft and other related functions.

The common theme existing in these new laws is how they affect our procedures. We have to document how we do our job, whether it is disposing of medical waste, used solvents, or old batteries. How we handle operations that generate air pollutants, how much fuel is used in certain equipment, and when and under what conditions the equipment is operated are also regulated. Many of these operations are subject to either state or local government permits. The permits issued by these local entities can and will regulate the way we perform our duties in support of the mission. Environmental management or the civil engineering shops implement Air Force Instructions and other guidance designed to conform to all laws to which we are subject.

You might ask as a maintainer, security police person, or medic how these laws affect you specifically? They will make your job more complex as they increase the amount of paperwork and documentation that must be accomplished to complete your everyday duties.

Civilian inspectors often check to verify this documentation and may forward it to state and federal environmental agencies as a matter of routine operation. This documentation may also be available for review by interested members of the public. Under the Clean Water Act, the documentation has been used to take the Air Force and other federal agencies to court to compel compliance with environmental laws.

The best way to cope with these changing times is to do your duties as assigned in the best compliance with laws and regulations. Pencil whipping required environmental documentation hurts your environment and breaks the law. Should a case come to court, the environmental law and litigation division of the Air Force Legal Services Agency is called upon to defend the interests of the Air Force.

The Superfund Law deals with toxic wastes disposed either in the ground or in a convenient waterway without concern for the environment. The Air Force is now defending these cases, sometimes for events that happened during or shortly after World War II, which ended more than 50 years ago. It is this legacy that the revolution in the nation's environmental laws was designed to change.

When Air Force members operate equipment in which environmental controls fail, the law requires reporting the failure. This requirement will vary from location to location and the responsible office for dealing directly with the state agency will be the environmental manager. Your staff judge advocate also has important responsibilities in this area. If there is a spill or some other reportable incident, follow your local procedures for reporting the incident through the chain of command. Prompt reporting ensures that environmental and health damage will be minimized. Lessons can be learned to prevent the same occurrence in the future, and we will comply with the law. As with all other military operations, bad news, in the environmental business, does not get better with age.✥

Environmental Information Exchange

If you would like to access important cross-feed information, check out the PRO-ACT website. It is a base-level environmental information exchange, sponsored by Air Force Center for Environmental Excellence. You can access environmental concerns including technical data, success stories, environmental awards, hazard material contingency plans, spill plans, and deicing chemicals.

All services other than providing this cross-feed of information, including requests for information, are limited to members of the U.S. Air Force, Air Force Reserve, Air National Guard, and Department of Air Force civilian employees. Contractors with active Air Force contracts may utilize the service for work that applies to their current delivery orders.

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